

A COMPARISON OF MICHIGAN STATE UNIVERSITY
STUDENTS WHO GRADUATED FROM VARIOUS
SIZE HIGH SCHOOLS ON THE BASIS OF INTELLECTIVE
AND AFFECTIVE VARIABLES AND ACADEMIC SUCCESS

Thesis for the Degree of Ed. D.
MICHIGAN STATE UNIVERSITY
Charles Moore Renneisen
1964



This is to certify that the

thesis entitled

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STUDENTS WHO GRADUATED FROM VARIOUS SIZE
HIGH SCHOOLS ON THE BASIS OF INTELLECTIVE
AND AFFECTIVE VARIABLES AND ACADEMIC SUCCESS

presented by

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has been accepted towards fulfillment
of the requirements for

Ph. D. degree in Education

Major professor

Date August 14, 1964



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ABSTRACT

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by Charles Moore Renneisen

The Problem

The purpose of this study was to investigate the adequacy of the educational development of students, who graduated from various size high schools and entered Michigan State University in the fall of 1958. Two general areas came under our scrutiny: the measurement of academic preparation through the study of intellectual variables, and a survey of attitudes and values to test for differences in this area among students from various size schools. A study of the academic success of these groups of students was accomplished through a comparison of final grade point averages in their senior year.

Methodology

In the collection of data, the three instruments used to test the intellectual variables were: The College Qualification Test, the Michigan State University Reading Test, and the Critical Test. The affective variables were

tested with Prince's Differential Values Inventory, Rokeach's Dogmatism Scale and the Inventory of Beliefs. The statistical method employed in the study was the analysis of variance. The null hypotheses were tested at the .05 level of significance. The high school size groups were divided into three categories based on the size of the graduating class. The small size group represented schools with less than one hundred in the graduating class. The medium size schools were those with class enrollments of one hundred to three hundred and ninety-nine and the high schools with over four hundred in the graduating class were listed as large schools.

Findings

The results showed no significant differences in the size groups on any of the intellectual tests when the students were tested as entering freshmen. Significant differences were in evidence when the freshman females were tested alone on the Michigan State University Reading Test. The Inventory of Beliefs and the Dogmatism Scale did not produce significant differences in the freshman groups but the freshman were significantly different on the Differential Values Inventory. The difference was traced to the female students who showed a tendency for the small school students to be more traditional

in their beliefs over the girls from the medium or large schools. In the follow-up study of college seniors, we found non-significant results on all of the four tests; the Critical Thinking Test and the three affective variable instruments.

In the survey of final college grade point averages, significant difference appeared in the study of the males, with the males from the medium size schools succeeding best. No significant differences were detected in the study of the females or when the sexes were combined.

Conclusions

Our general conclusion is that there appears to be very little difference among the graduates of the various size high schools who entered Michigan State University in 1958. Academically, the intellectual tests given to entering freshman indicated no differences in the preparation of these students. The affective variables showed only slight differences. This was in the area of traditional values versus emergent values. The differences in this area disappeared by the time the students became graduating seniors.

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By

Charles Moore Renneisen

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF EDUCATION

College of Education

1964

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ACKNOWLEDGMENTS

The writer would like to express his sincere thanks to the many persons who have assisted him in completing this work. Particular recognition should be given to Dr. Floyd G. Parker the major advisor. His kind words of encouragement and assistance were especially valuable.

To the members of the guidance committee, Dr. Fred Vescolani, Dr. James W. Costar, and Dr. Robert H. Horwitz, the author gives his heart felt thanks for their time and guidance. To Dr. Stanley Hecker and Dr. Alan Grimes, the Author wishes to express his appreciation for their substitutions for members of the guidance committee who were out of the country during the oral exams. The author wishes to thank Dr. Stanley O Ikenberry of Michigan State University for the use of the test results of the major study of the 1958 freshman class at Michigan State University.

Finally, the writer is deeply appreciative of the ever-present help of his wife, Phyllis.

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Final Examination: July 7, 1964, 10:00 A.M. Room 419
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CHAPTER I

PREFACE

The Setting

Many assumptions are made by school patrons and educators in regard to the fundamental causes of college student mortality. One that is often heard is the lack of adequate preparation provided by the secondary schools. Particular criticism has been leveled at the small high school. Dr. Clifford B. Smith,¹ of Ohio State University, concluded from his study of Ohio secondary schools that schools with fewer than two hundred students are paying a premium for an inferior program. Howard A. Dawson, of the National Commission of School District Reorganization, stated:

Studies of the services needed for a satisfactory program of education through the high school show that these cannot be provided most economically and effectively by a district having fewer than 10,000 students. The minimum for a high school should be 1,200 to 1,500 students.²

¹Clifford B. Smith, "A Study of the Optimum Size Secondary School" (Unpublished Doctoral Dissertation, Ohio State University, 1960.)

²Howard A. Dawson, et al., Your School District, National Commission of School District Reorganization, Department of Rural Education, (Washington, D.C.: National Education Association, 1948).

Critics of the small school generally point to its limited curricular offerings, overworked and poorly trained teachers, lack of adequate supervision of instruction, and insufficient laboratory equipment as some of the reasons behind their efforts to consolidate these smaller high schools. Dr. Conant,¹ in his study of the nation's high schools for the Carnegie Foundation, observed that 17,000 of the 21,000 high schools in the United States are too small to provide an adequate variety of courses.

In spite of the strong opinions of some of our leading educators that we eliminate the small high school, the consolidation programs have been progressing at a slow rate. In Michigan, in 1963-64 approximately forty-three percent of the high schools had enrollments of four hundred or less.² Ninth-two schools had less than two hundred enrolled on a regular basis. Even allowing for the sparsely populated Upper Peninsula, there still remains a large number of districts in the Lower Peninsula which have desired to maintain the status quo.

Advocates of the small high schools often express the belief that the proper development of attitudes and values

¹James B. Conant, The American High School Today (New York: McGraw-Hill Book Co., 1959), p. 140.

²Michigan Education Directory Service, Michigan Education Directory and Buyer's Guide, 1963-64, Lansing Michigan.

depends on small classes and close personal relationships between the teachers and the students. Saupe,¹ in a study of University of Missouri students, concluded:

The students of the smaller schools may have acquired superior habits of study which stand them in good stead when they apply them to their tasks as university students.

E. L. Thorndike points out some social disadvantages as schools become too large:

Teachers do not know one another. Pupils have less chance of becoming humanized and more danger of becoming institutionalized. Democracy loses an effective helper. Athletics become a question of finance rather than play. The boys mimic college fraternities and men's clubs in their social organizations.²

The large schools seek to develop the "whole child" through specialized personnel, such as guidance counselors, deans, psychologists and homeroom teachers. Archibald Shaw³ relates that the Greeks had another kind of teacher, separate from the "schoolmaster". He was called the pedagogue. He was responsible for the development of attitudes, habits, and attributes. Today, we assign both the role of the schoolmaster and the pedagogue to the teacher. Shaw explains:

¹Mildred W. Saupe, "Size of High School as a Factor in the College Success of Average and Superior Graduates," Journal of The American Association of Collegiate Registrars (October, 1941).

²E. L. Thorndike, "A Neglected Aspect of the American High School," Educational Review, 33:245-255.

³A. B. Shaw, "A New Look at Secondary Education: A Random Fall Idea," School Executive (March, 1956), 75:47-86.

Putting more cross grids of support under the student - vocational guidance counsellors, psychologists, students personnel services - may meet the need, but it is our hunch that the very specialization of personnel has what Toynbee calls "awkward consequences worth attention" - and that it will cost as much and require as many people.¹

And so the arguments go. It often appears that local conditions and sentiment are the real roadblocks to an objective study of the question of optimum school size. It is the purpose of this investigation to develop a more scientific argument in our approach to consolidation in the state of Michigan. Along with an analysis of academic abilities and success at college of students from various size high schools, we aim to determine if there are measurable differences in the attitudes and values of college students from these schools.

Since schools today are becoming increasingly concerned with their responsibility in personality development of the student, the information gathered in this investigation will be of assistance to school counselors in their analysis of student adjustment problems. With the aid of elaborate advisory programs in the residence halls and counseling center, colleges seek to guide the student into a gradual adjustment to the rigors of higher education.

¹Shaw, op. cit., p. 74.

The Problem

The problem to be investigated concerns the adequacy of the educational development of students, from various size high schools, who matriculated to Basic College at Michigan State University in 1958. The present study sought to approach the analysis of educational development from four aspects. First, as beginning freshmen, the groups were compared on the basis of scores made on three intellectual tests. At the same time, the students were given three instruments which attempt to measure the affective variables of attitudes and values. A follow-up study was carried out four years later on those students who were now graduating seniors. A battery of four tests were administered at this time to collate changes which might have taken place as a result of the college experience. Finally, a comparison was made of the cumulative grade point averages of the various groups, after four years of college work.

The importance of this study is emphasized by the need for more information about the products of our various size secondary schools. Parents and voters are charged with the responsibility of deciding at the polls the questions of consolidation and reorganization of school districts. Many times their judgments are based on bias, sentiment and prejudice rather than factual evidence.

The question of what is the optimum size high school is constantly in the minds of school administrators. They endeavor to provide the best possible education at the most reasonable cost. As it is pointed out later in our review of the research and literature on this subject, the opinions of these educators vary widely when questioned as to what they thought would be the optimum size school.

College admissions officers are continually striving to improve their selection procedures. Is it true, as is sometimes proposed, that the graduates of the small high school find it difficult keeping up with their peers from the larger high schools when in competition in the college classroom? Should the admissions officers weigh the size of the high school in working out a formula for comparing the college applicants?

College guidance counselors are also interested in the information of this kind of study. They wish to know more about those factors that can be related to college success. Should they give additional guidance to a certain group of students, such as those from the small high schools, particularly during their first semester at college? Do students from the large high schools exhibit attitudes which some colleges would seek to change by organized means? These, and other similar questions, need to be answered in our ever increasing program of guidance for the college student.

Residence hall advisory staff members can likewise use this type of information in the development of programs which assist the student in achieving maximum success at college. These guidance workers are particularly concerned with the development of socially accepted attitudes and habits. They point out to their advisees the handicap that certain unfavorable attitudes would be in various life situations.

Last, but not least, the college student himself can directly profit by having additional information which would assist him in understanding his possible weaknesses and strengths. To be properly forewarned that his previous experiences have not been the equal of some of his college competitors would be an asset to the beginning freshman.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

A multiplicity of approaches has been used over the years by researchers in attempts to evaluate the effects of high school preparation upon college achievement. In this study, we are concerned with those investigations which relate size of high school to future academic success at college and, also, the relationship of size to the development of values and attitudes.

In a democracy, the proficiency of an educational program is to be judged by both its achievements in the scholastic area and its concern for the training of effective citizens and public leaders. The interest of educators in the proper development of attitudes and values is therefore understandable. This study will investigate whether or not the size of the high school had an effect upon these characteristics with those students who went on to college.

The uniqueness of this particular investigation is based on the following points: the sample size is large in comparison to some of the previous studies; this is the

first major study with Michigan schools; a longitudinal study with a four-year look at the sample; improved statistical methods; and a three group comparison for a clearer analysis and application of the statistics to practical situations.

The review of the literature has been divided into four main categories:

- a. Statistical research relating high school size and academic success at college
- b. Professional opinions concerning the optimum size secondary school
- c. Research relating high school size to the development of attitudes and values
- d. Research dealing with attitude change during the college years

High School Size and Academic Success at College

The review of previous research relating high school size and college success reveals an interesting pattern of results. In the earlier studies, when students from various size high schools were compared on the basis of college achievement, the results showed significant differences. Four of the five studies reviewed, showed results favoring the large size high school. One study showed preference for the small school, while none indicated the medium size to be best.

On the other hand, in the five more recent investigations, there were no significant differences in college grade point averages of the various high school size groups.

Earlier Studies:

In 1911, Pittenger surveyed the freshman grades of the within state students at the University of Minnesota. His conclusions were that the graduates of the larger high schools might be expected to do better than those from the small schools, but he cautioned his readers against making too great a generalization from these findings:

It is probable that the size of a high school exercises only an indirect influence upon the college efficiency of its graduates, through other more vital factors which are correlated with it. Size is but the sign of their presence or absence. A large school, for instance, is generally better equipped than a small school, and usually employs teachers with broader training and experience. Both these facts, and probably others, should make for higher efficiency of its graduates in college.¹

The next major study on this question was performed a little over a decade later, in 1922, by Thornburg² at the State College of Washington. His study, like

¹Benjamin Floyd Pittenger, The Sixteenth Yearbook of the National Society of Education Part II (Bloomington, Illinois: Public School Publishing Company, 1919), p. 10.

²L. H. Thornburg, "College Scholarship and Size of High Schools," School and Society (August, 1924), 20:189.

Pittenger's, dealt only with freshman grades. He concluded that students from the large high schools achieve superior grades at college. Some technical questions could be raised concerning the scientific findings of this particular study because the level of significance was not reported in the statistics. In spite of the fact that his tables indicated higher intelligence test scores for the larger school groups, Thornburg generalizes that the accomplishments of the students from the larger high schools must be due, to a great extent, to the training which these schools gave.

Size of high school and length of school year were both examined for any relationship to academic success at college by Stalnaker and Remmers of Purdue. After their 1930 investigation, they made the following generalizations:

- a. The size of high schools in Indiana is significantly related to elimination from Purdue University
- b. Length of school term is also significantly related to elimination from Purdue University
- c. First semester freshman grade averages show a very slight though significant relationship with size of high school
- d. First semester grades also show a tendency to be related to length of high school term although the relationship is not clearly statistically significant.¹

¹J. M. Stalnaker and H. H. Remmers, "What Kind of High Schools Contribute to College Failures?" Bulletin of Purdue University (March, 1930), 30:23.

By grouping the various size high schools into categories of large, medium and small, Brown¹ noted that the larger high school students obtained better first semester grades in twenty Michigan colleges in 1928. She remarked that the trend was not consistent when additional bread-downs were made.

The final investigation of the reported earlier studies was one made by Saupe at the University of Missouri in 1941. She limited her examination of freshman grade records to average and above average students. Her findings showed the average freshman from the smallest high schools earned a higher mean scholarship index than the average freshman who graduated from any of the classes of larger high schools. She theorized from this:

The students of the smaller schools, who lack diversified learning experiences, especially those of the average range, may have acquired superior habits of study which stand them in good stead when they apply them to their tasks as university students. It is possible that in the smallest schools, classes are smaller and individual students receive greater personal attention, and thus they are directed into practices which result in superior study habits.²

¹Ruth A. Brown "A Study of High School and First Semester College Records of Freshmen Entering Twenty Colleges in Michigan in 1928," Journal of the Michigan Schoolmasters' Club (1930), p. 18.

²Saupe, op cit.

Recent Studies:

In 1949 at Purdue, White¹ made a study of the University's admission criteria. His findings revealed that size of high school had no relationship to college success at that state university.

Shafer,² in a study of students entering certain Iowa colleges, came to the same conclusions as did White. This investigation was carried out in 1956. The size groupings used by Shafer were as follows: 0-99; 100-199; 200-499; 500-999; and 1,000 and above.

Similar research was produced at Kansas State in 1956 by Donald Holt.³ Using the freshman class, he attempted to answer the following questions: How does high school size compare in terms of the ability of the various graduates to do college work? Should the high school rank be interpreted differently for various size schools? His conclusions were:

1. In terms of college potential (ACE scores), no differences existed among the various size high school graduates.

¹Harland W. White, "A Study of the High School Record as a Criterion for Admission to Purdue University" (Office of Admissions, Purdue University, 1951), p. 25.

²Dwight Shafer, "Analysis of Certain Factors in the High School Preparation of High School Graduates Entering Selected Iowa Colleges" (unpublished Doctoral Dissertation, University of Iowa, Iowa City, 1956), p. 121.

³Donald P. Holt, "Size of High School and College Grades," Personnel and Guidance Journal (April, 1959), 37:569.

2. In terms of first year grades, no differences existed among the various size high school graduates.
3. For males, only the small high school graduates had higher high school rank.
4. Wide sex differences in first year grades, with the females higher, but since no differences occurred in the ACE scores, this might indicate a difference due to non-intellectual factors.
5. The high school record was a good predictor for all groups.
6. Inconsistencies in research suggests institutional differences.¹

In 1957, Altman reviewed the research concerning high school size and college success and concluded:

There appears to be no disagreement among writers that rank in class or scholarship are factors important to academic success in college, but size of high school as a predictor of success is still questioned.²

Most of the previous researchers concerned themselves with the study of freshman grade point averages as related to high school size. Altman, on the other hand, decided to investigate the long range effects by studying the grade point averages of college seniors. He divided the high schools into four divisions, similar to those used by the Michigan State High School Athletic Association:

¹Ibid., p. 570.

²Esther Royal Altman, "The Effect of Rank in Class and Size of High School on the Academic Achievement of Central Michigan College Senior Class of 1957," Journal of Educational Research (April, 1959), 52:307.

<u>Class</u>	<u>Enrollment</u>	<u>Sample Size</u>
A	900 plus	42
B	375-899	54
C	175-374	37
D	under 175	10

From the results he obtained, Altman concluded that the graduates of the larger high schools did not achieve significantly higher college grades than did the graduates of the smaller high schools. Criticism of this journal report might be leveled at: the fact that the statistical methods were not reported; the level of significance was not given; and the sample size, particularly of the small size schools, was definitely limited.

The most complete research study in this field was made by Young¹ at Purdue in 1958. He included in his investigation a statistical control of scholastic aptitude. Another feature of Young's study was his separation of the student groups into college majors. His subjects were the 1952 freshman class at Purdue.

In the results of his study, Young had this interesting comparison:²

¹John Frederick Young, "A Comparison of the Academic Preparation and Achievement of College Students from Various Size High Schools in Indiana" (unpublished Doctoral Dissertation, Purdue University, West Lafayette, Indiana, 1960).

²Ibid.

<u>Size of HS</u>	<u>% that completed 8 semesters</u>	<u>% that changed majors</u>
0-99	44.1%	17.6%
100-199	40.7%	22.1%
200-299	42.5%	18.9%
300-499	41.4%	21.9%
500-999	41.9%	14.4%
1000-plus	47.4%	18.6%

Young concluded that no significant relationship existed between high school size and:

1. times on grade probation
2. number of courses failed
3. number of semesters completed
4. final semester grade index¹

The results of this investigation showed that students from smaller high schools did not do as well as those from the large high schools in first semester grade averages in the Engineering School, but in the Schools of Science, Education, Agriculture and Home Economics, no differences were in evidence.

In 1962, Harmon² reported on the relationship between doctorate productivity and size of high school graduating class. The author pointed out that apparently something was happening in the high schools to differentiate the people who, more than a decade later, will earn doctorate degrees in various scholarly fields. He

¹Ibid., p. 99.

²Lindsey R. Harmon, "On Decision Making in High School," National Association of Secondary School Principals Bulletin (November, 1962), 46:277.

concluded that size of high school, as reflected in size of graduating class, has a profound effect on the probability of an individual's going on to college, to graduate school, and eventually to the doctorate degree.

Professional Opinion Concerning the
Optimum Size School

While a wide range of suggestions have been made in this field over the years, consensus of professional opinion, as to the adequacy of the various size high schools, seems to favor the medium size.

Gaumnitz and Tompkins of the U.S. Office of Education wrote:

There seems to be some recognition that the very large high schools tend to a mass production type of education which is undesirable. No clear maximum or minimum size high school has been established as a result of research, but definite ideas are emerging to suggest the high school ranging in enrollment from 300 to 1,200 tend to include the optimum.¹

Dr. James B. Conant, a noted authority in this area of education, after a nationwide study of secondary schools and their problems, concluded that the small high school was not providing the rich, educational experiences that are available in the larger schools. Although he did not

¹Walter H. Gaumnitz and Ellsworth Tompkins, "How Large Are Our Public Schools?" Federal Security Agency, Office of Education, Circular No. 304.

suggest the optimum size school, he proposed that the minimum size of "one-hundred in the graduating class" be established.¹

One can also find strong feelings among educational writers that the large high schools are not the ideal solution. In their well-known book, Educational Administration, Concepts, Practices and Issues, Morphet, Johns and Reller wrote:

The school should be large enough to make available necessary specialized competencies and services at reasonable cost. It should be small enough to facilitate the development of competencies that may result from genuine involvement in the life of a society. The desirable size of schools has not been determined through any rigidly scientific procedures. However, it would appear that there is rather widespread agreement concerning approximate desirable ranges of population of schools. Senior high schools with a population of 400 to 1,500 would appear to be desirable.²

The school superintendents themselves seem to favor a lower minimum and a slightly lower maximum. In an editorial survey conducted by the Nation's Schools magazine in 1954,³ it was reported that the largest percentage of administrators, thirty-seven per cent,

¹Conant, op cit.

²Edgar L. Morphet, Roe L. Johns and Theodore L. Reller, Educational Administration, Concepts, Practices and Issues (Englewood Cliffs, N.J.: Prentice-Hall, 1959)

³"What Size School is Best?" Opinion Poll, Nation's Schools (October, 1954), 54:59.

avored the size category of 150 to 400 enrollment.

Combining categories in their study, we find that the vast majority, ninety-two percent, believed the optimum size fell in the range of 150 to 1,200. The groupings and percentages were as follows:

<u>School Size</u>	<u>Percentage Approving</u>
Less than 150	3%
150-400	37%
400-750	31%
750-1,200	24%
1,200-2,000	5%
over 2000	0%

The greatest significance of this survey might be found in the fact that none of the superintendents voted for the category of "over 2,000," which is the size of the vast majority of schools in metropolitan areas.

In 1949, Oliver¹ surveyed school superintendents and state department field consultants on the quest of the most desirable size high school. He reported that 79.5% of these educators indicated preference within the range of 500 to 1,000 enrollment.

Through the years, various state departments of education have conducted studies to determine the optimum size high school, or the minimum size allowable for an

¹A. I. Oliver, "How Big Should the Small School Be?" School and Society (1949), 69:128.

adequate education. The Indiana School Study Commission¹ recommended that the minimum size high school have a membership of approximately 300.

A complete analysis of size, cost and educational opportunity in secondary schools of New York was compiled by Kowitz and Sayres. They concluded:

The results of the present study would seem to indicate that schools with a secondary enrollment of less than 500 pupils are operating at a disadvantage in terms of certain indices of educational opportunity and are operating uneconomically compared with schools somewhat larger. The most economical size for the secondary school would seem to lie between 600 and 800 pupils. In this interval also, the indices of educational opportunity showed generally to greatest advantage relative to cost.²

Shannon³ argued against the small school approach to education on the basis of the limited program offerings and the excessive cost. He believes that the only way to keep adequate administrative and supervisory services with disproportionate costs is to have comprehensive high schools.

¹Indiana School Study Commission. "An Evaluation of the Indiana Public Schools," Commission Report (Indianapolis Indiana, 1949), p. 332.

²Gerald T. Kowitz and William C. Sayres, Size, Cost and Educational Opportunity in Secondary Schools, Division of Research, New York State Education Department, Albany, New York, p. 71.

³J. R. Shannon, "Criteria for Determining Local Units of School Administration," American School Board Journal (October, 1949), 64:28.

Schools below a certain limited number of students have been censured by various professional organizations. The American Association of School Administrators' Yearbook, 1958,¹ emphasized the lack of well-prepared teachers as the main disadvantage of high schools with under 300 enrollment. The exodus of good teachers to the larger schools was attributed to salary increases and the desire to teach full-time in their preferred areas.

Research Relating High School Size to the
Development of Attitudes and Values

Psychological considerations must be recognized in determining the effectiveness of various size high schools. Small school advocates have consistently argued against the impersonal approach they contend is inevitable with large enrollments.

Livingston² emphasized this point in his article in Progressive Education in 1956:

Students of adolescent development have stressed the need for a wide variety of educational experiences on the part of adolescents, the need for such youth to identify and become a part of their school, and the need for personal guidance of other than a vocational nature. The general business of educating children and youth can best be carried out in an atmosphere of friendly cooperation. Some of the

¹Ester Royal Altman, "The High School in a Changing World," American Association of School Administrators' Yearbook 1958 (Washington, D.C.).

²A. Hugh Livingston, "Is There an Optimum Size High School?" Progressive Education (September, 1956).

considerations discussed previously allude to the notion that a very large school tends to limit rather than extend these opportunities. It is felt that a large school may contribute to personality disintegration and unsuccessful participation by failing to meet these needs.

This same conclusion was reinforced by a research memo issued by the National Education Association Research Division. They had this to say about the psychological climate of the various size schools:

Although it is agreed that a minimum number of pupils is necessary for an adequate educational program, there is a growing recognition of the fact that it may be difficult, and probably impossible, to maintain the quality of desirable human relations and pupil development in schools that are too large.¹

The effects of the large school environment are so interwoven with similar consequences brought on by the impersonal relationships experienced by the students from the large city that it is impossible to say with any degree of certainty which was the major contributing factor. In spite of this handicap, there is strong evidence to indicate the end products of these developmental conditions, the large city and the large school, are somewhat different in their attitudes and values than the students who live in small towns and attend small schools.

¹National Education Association Research Division. "Efficient School Size", National Education Association Bulletin (Washington, D.C., January, 1959).

One guage of any individual's attitude and value system is his choice of vocation. Elsbree and Reutter point out in their book, Staff Personnel in the Public Schools:

The rural areas of the United States have contributed a much larger proportion, relatively, of teachers than have the urban centers. Similarly, in the past, graduates of small high schools have been more favorably disposed toward teaching than graduates of large high schools. Whether or not the interest in teaching exhibited by pupils in rural areas and those graduating from small high schools is due to limited vocational opportunities or to some phase of the educational program cannot definitely be stated.¹

The argument for the large school is sometimes based on the logic that in order to provide the proper guidance facilities it is necessary to establish large schools which can support such programs. The rationale being that with better counseling programs the large schools are better able to perform the work of attitude and value development. The logic is clear but the facts do not always verify that this is what happens in reality. In a survey of thirty-three of the nation's largest school systems, a teachers' group found that better than one-third admitted that their present counseling facilities did not meet their needs. All the

¹Willard S. Elsbree and E. Edmund Reutter, Jr. Staff Personnel in the Public Schools, (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1954), p. 23.

secondary schools in this survey had well over 1,000 in enrollment.

Research Dealing With Attitude Change
During the College Years

It is well to note at the beginning of our review of the research in this area the dangers involved in generalizing from one campus to others. As Nevitt Sanford has pointed out, the educational philosophy of each school will determine the degree of emphasis each school places on character building. He states:

It appears that much educational theory is based upon the notion that personality is well established by the age of seventeen, particularly that which assumes that the student will choose his experiences in accordance with notions that are now basic to his personality and the chief job of the college is to help him acquire the means for the successful pursuit of his purposes. The contrasting educational view is that colleges should be concerned, not so much with teaching students how to realize their values, as with helping them decide what values to have. That instead of permitting them to become confirmed in patterns of motives whose determinants have been childish or accidental, the college should encourage the development toward patterns that are valued in our society.¹

In this area, the present study will attempt to answer the following questions: Are there differences in the attitudes and values of the students entering Michigan State University from various size high schools? Do these differences remain after four years of college life?

¹Nevitt Sanford, "Personality Development During the College Years," Personnel and Guidance Journal (October, 1956), 35:64-80.

If there are changes in attitudes and values of the students during their college years, Dr. Edward D. Eddy believes it represents a move toward conformity with the group. So that, if differences are found among various groups of freshmen, he thinks that these same differences are not likely to be present among the seniors. He states:

In most colleges which we have visited, we found that student and faculty conformity was so much the rule that we questioned whether the genuine, sincere individualist could ever be accepted. We were tempted to wonder, for instance, what might happen to a student with ability who refused completely to go along with the group.¹

This same conclusion was reached by Philip E. Jacob in his well-known book, *Changing Values in College*. Jacob presents the view that American college students today tend to think alike, feel alike and behave alike. He writes:

Most American students share many values in common. There is a striking homogeneity of basic values throughout the country. On issues where students do differ, they split in about the same proportions at most institutions. The patterns of value tend to be similar at American colleges, regardless of location, administration, size and background of the student body, or character of the educational program.²

¹Edward D. Eddy, The College Influence on Student Character, American Council on Education, (Washington, D.C., 1959), p. 137..

²Philip E. Jacob, Changing Values in College, (New Haven, Connecticut, Hazen Foundation, 1956), p. 14.

A study of University of Buffalo students by Bugelski and Lester also revealed the tendency for college students to think alike. Their conclusions were:

- (1) a significant change in attitudes between freshman and senior years on an "opinion test," which concerned national and social optimism, labor problems, discipline, social life, conventions and religious
- (2) the change was toward greater liberality
- (3) a test given three years after graduation showed little change in attitudes from those in the senior year.¹

A number of studies found significant changes in attitudes occurring during the four years of college. Kuhlen² discovered increased sensitivity to human qualities with such characteristics as tolerance, cooperativeness, broadmindedness and democratic attitudes. Plant³ concluded that significant changes took place resulting in less of a readiness to accept ethnocentric ideology.

Webster⁴ also reported findings that did not support the view that college students become more alike in their

¹Richard Bugelski and Olive P. Lester, "Changes in Attitudes in a Group of College Students During Their College Course and After Graduation," Journal of Social Psychology (1940), 12:319-332.

²Raymond G. Kuhlen, "Changes in the Attitudes of Students and Relations of Tests Responses of Judgments of Associates," School and Society (April, 1941), 53:514-9.

³Walter J. Plant, "Changes in Ethnocentrism Associated with a Four-Year College Education," Journal of Educational Psychology (1958), 49:162-5.

⁴Harold Webster, "Changes in Attitudes During College," Journal of Educational Psychology (1958), 49:109.

general attitudes. His results reinforced those personality theories which emphasize the increased complexity, differentiation, ability and independence of students during their late adolescence.

Dressel¹ reported, in 1954, that the effectiveness of college experience in inducing change is still in doubt. He suggests that colleges form programs which encourage substantial interest changes.

¹Paul L. Dressel, "Interests - Stable or Unstable," Journal of Educational Research (1954), 48:95-102.

CHAPTER III

METHODOLOGY

Instruments Used in the Study

The following battery of tests was given to every freshman, except foreign and transfer students, entering Michigan State University in the fall term of 1958. The three non-intellective measures, along with the Critical Thinking Test, were also given to the graduating seniors in 1962 as a follow-up study.

College Qualification Test (CQT)¹ This test consists of three parts; seventy-five items designed to measure verbal ability; fifty items which measure skill in handling numerical concepts; and seventy-five items which test general information. The summation of these scores is compiled and the individuals are ranked on a percentile basis.

The reliability coefficient of the College Qualification Test was estimated by the authors to be .97 for the

¹Stanley O. Ikenberry and Irvin J. Lehman, Critical Thinking, Attitudes and Values in Higher Education, (Michigan State University, East Lansing, Michigan 1959), p. 11.

males and .96 for the females.¹ A check of the reliability was made by Ikenberry² using a restricted sample of the population of this study. It revealed a reliability coefficient of .93.

The College Qualification Test is used as a predictor of collegiate success, as based on the grade point average. The validity of this test, when applied to the sample population of this study, was investigated by Ikenberry.³ He found correlation coefficients ranging from .34 to .66, in comparing the relationship of CQT scores to freshman grade point averages. He noted that the magnitude of the correlation coefficients tended to decrease from the fall term of the freshman year to the spring term. Ikenberry speculated that this decrease might be "due to several factors including a narrower range of ability in the latter terms due to acceleration and withdrawal of some students, and possible fluctuation and change in student ability from the time of measurement in the fall."⁴

¹George K. Bennett, Marjorie G. Bennett, Winburn L. Wallace and Alexander C. Wesman, College Qualification Tests, Manual, (New York: The Psychological Corporation, 1957).

²Stanley O. Ikenberry, "A Multivariate Analysis of the Relationship of Academic Aptitude, Social Background, Attitudes and values to Collegiate Persistence" (unpublished Doctoral Dissertation, Michigan State University, East Lansing, Michigan 1960), p. 50.

³Ibid., p. 49.

⁴Ibid., p. 50.

Michigan State University Reading Test.--The construction of this test was the produce of the Office of Evaluation Services of Michigan State University. Along with the College Qualification Test, it was used as a predictor of academic success at Michigan State. The Basic College of the University divided the freshman class into groups based on their scores on these two tests. At the end of the term, the students were ranked in accordance with their grade point averages. For example, if a student ranked in the upper ten per cent on the test scores and was achieving a GPA which placed him much lower in percentile rank, that was an indication that he might be underachieving and in need of counseling.

The MSU Reading Test, which contains forty-five items, measures reading speed and comprehension. The validity of the test is based on its ability to correlate highly with the first year grades at Michigan State University. A study of this correlation was done by Ikenberry,¹ who found a range of .34 to .52 for females in freshman grades and a range of .36 to .57 for the males. In a breakdown of particular subjects, he found the highest correlation between the Reading Test and freshman communication skills grades for the males. This correlation was .65. The lowest correlation was the male average for

¹Ibid., p. 53.

natural science in the third term. This correlation was .35. We can readily see that the Reading Test is a fair predictor of future college success at Michigan State. After a check of the scores of a restricted sample, the authors estimated the reliability of their test to be .80.

Critical Thinking Test, Form G.--This is a problem solving type of test that was constructed by Dressel and Mayhew.¹ Its fifty-two items are intended to measure five factors of critical thinking:

- (1) define a problem
- (2) select pertinent information
- (3) recognize stated and unstated assumptions
- (4) formulate and select relevant and promising hypotheses
- (5) draw valid conclusions and judge the validity of the inference²

Ikenberry and Lehmann³ tested the validity of the Critical Thinking Test with the following freshman grades: communication skills, natural science and term grade point

¹Paul Dressel and Lewis B. Mayhew. General Education: Explorations in Evaluation (Washington, D. C.: American Council on Education, 1954).

²Ibid.

³Ikenberry and Lehmann, op. cit., p. 14.

averages. The Pearson product-moment correlation coefficients were significant in all phases at the .05 level. The range of these correlations was from .21 to .57.

Reliability checks on this test were reported to range from .71 to .89, according to the manual for instructors.¹ Ikenberry² found a reliability coefficient of .79 when he used the Kuder-Richardson formula on a small sample of his study.

Inventory of Beliefs, Form I.--This instrument, developed by Dressel's Committee on Student Values and Attitudes,³ consists of one-hundred and twenty forced-choice, pseudorational statements to which the respondent replies as follows:

Strongly agrees	4 points
Agrees	3 points
Disagrees	2 points
Strongly disagrees.	1 point

The high scores were listed as being independent, adaptive and non-stereotypic in beliefs. The low scores

¹Paul L. Dressel, Cooperative Study of Evaluation in General Education, Instructor's Manual for the Test of Critical Thinking, Form G. The American Council on Education, Committee on Measurement and Evaluation (1953) (Mimeograph.)

²Ikenberry, op. cit., p. 52.

³Dressel and Mayhew, op. cit., p. 20.

were described as being defensive, conforming, resistant and stereotypic.¹ Recognizing the difficulty in measuring the validity of instruments dealing with attitudes and values, Ikenberry states:

We can conclude that although characteristics measured by the Inventory of Beliefs are not independent of the phenomenon measured by the cognitive instruments, the Inventory appears to be measuring characteristics more clearly related to factors measured by the Dogmatism Scale.²

The reliability estimates, as reported in the instructor's manual, are in the range from .69 to .95, with the median being .84.³

In a comparison of Inventory of Beliefs scores and freshman grades in natural science and communication skills courses at Michigan State University, Dr. Ikenberry came to the following conclusion:

Although these relationships are slight, (highest correlation coefficient is .33), they are generally consistent and indicate that students who are less stereotypic in beliefs tend to receive higher instructor, exam, and total grades in the two basic courses.⁴

¹Ikenberry and Lehmann, op. cit., p. 9.

²Ikenberry, op. cit., p. 55.

³Cooperative Study of Evaluation in General Education, Paul L. Dressel, Director. Instructor's Manual for the Inventory of Beliefs, The American Council on Education, Committee on Measurement and Evaluation (1953). (Mimeograph.)

⁴Stanley O. Ikenberry, and Irvin J. Lehmann. Critical Thinking, Attitudes and Values in Higher Education, A Preliminary Report, (Michigan State University, East Lansing, Michigan 1959), p. 57.

Rokeach's Dogmatism Scale, Form E.¹--The scale consists of forty statements, such as, "It is better to be a dead hero than a live coward." The subject is forced to agree or disagree and decide to what degree or extent he does either on a six point scale, ranging from strongly agree to strongly disagree. The higher the score, the more dogmatic the subject would be rated.

Author Rokeach defines dogmatism as follows;

A total ideological defense against threat and at the same time a cognitive framework for satisfying one's need to know and comprehend the world one lives in. In other words, dogmatic thinking and believing makes it possible to ward off threatening aspects of reality and at the same time gives one the satisfaction of feeling that one understands it.²

A high score on the Dogmatism Scale correlates highly with a low score on the Inventory of Beliefs. Recent research has found this negative correlation to be as high as $-.63$ for males and $-.61$ for females.³

Rokeach has outlined a framework for this study of dogmatism as being:

- a. a relatively closed cognitive system of beliefs and disbeliefs about reality

¹Rokeach, Milton J. "Political and Religious Dogmatism: An Alternative to Authoritarian Personality," Psychological Monographs (1956), 70:425.

²Ibid., p. 5.

³Ikenberry, "A Multivariate Analysis. . .," op. cit. pg. 56.

- b. organized around a central set of beliefs about absolute authority which, in turn
- c. provides a framework for patterns of intollerance and qualified tolerance toward others.¹

Reliability coefficient of .76 was obtained by Ikenberry² in using a restricted sample of his study. Rokeach reported a median reliability of .78 using the odd-even method.³

Differential Values Inventory.--This instrument, consisting of sixty-four forced-choice items, was constructed by Prince.⁴ Its purpose is to differentiate between the subject who holds a traditional value system as opposed to one who maintains an emergent value orientation. Needless to say, there is no right and wrong determination in this type of testing. An attempt is made to categorize groups of individuals according to the kinds of values that to them are the more important.

Prince describes the traditional subject as holding in high esteem the following values:

¹Milton Rokeach, "The Nature and Meaning of Dogmatism," Psychological Review (1954), 61:203.

²Ikenberry

³Rokeach,

⁴Richard Prince, "A Study of the Relationship Between Individual Values and Administrative Effectiveness in the School Situation" (unpublished Dissertation, University of Chicago, Chicago, Illinois, 1957).

personal respectability, thrift, self-denial, respect for elders, as valuing hard work as good in itself and necessary for success, as placing his individual desires and ideas equal to or above the desires and ideas of the group, and being oriented toward the future to the extent that present needs should be sacrificed for future satisfaction and reward.

A person with a high emergent value system places a great deal of importance on getting along with others and achieving group harmony. Absolutes are questionable and morality is group-determined rather than predetermined by any particular source. Everything one does should be done in consideration of others and in regard for feelings and reactions of others. Emphasis is on the present.¹

Ikenberry and Lehman² reported that Catholic college students held the more traditional value approach, as outlined above, in comparison to their Jewish counterparts. Students from the urban areas scored high in emergent values while the students with rural backgrounds were high in the traditional values. Those students who expressed an interest in graduate school scored higher on the traditional values than those who were satisfied with a bachelor's degree.

The reliability coefficients for this test were .61 for the males and .60 for the females. These were found on a test-retest situation with college freshmen.³

¹Prince, op. cit., p. 42.

²Ikenberry and Lehmann, op. cit., p. 122.

³Ibid., p. 74.

Collection of the Data

This study is a supplement to a major research project conducted at Michigan State University by their Office of Evaluation Services. The following battery of tests were given to the freshman class of 1958:

The College Qualification Test
The Michigan State University Reading Test
The Test of Critical Thinking, Form G
The Inventory of Beliefs
Rokeach's Dogmatism Test
The Differential Values Inventory, Form I¹

A follow-up study was carried out in the spring term of 1962, using as subjects those seniors who were nearing graduation. The instruments used in this retesting were:

The Critical Thinking Test
The Inventory of Beliefs
Rokeach's Dogmatism Scale
The Differential Values Inventory

Also included in the follow-up study were the final grade point averages of the graduating seniors. Their point averages were based on the scale of 4.0 for A, 3.0 for B, 2.0 for C, and 1.0 for D. An F is failing and no points are given for this grade.

Background information in regard to the size of the high school graduating class was used as a criterium for determining the approximate size of the high school. The following figures indicate the breakdown of the high school size groups.

¹Ikenberry and Lehmann, op. cit., p. 9.

SEPARATION OF SUBJECTS OF POPULATION ACCORDING
TO SIZE OF HIGH SCHOOL AND SEX

High School Size Group	Range of Size of Graduating Class	Males N - %	Females N - %	Total N - %
A	400 or more	472-33	338-26	810-30
B	100 - 399	692-48	688-53	1380-50
C	99 or less	268-19	282-21	550-20
	Totals	1432	1308	2740

The breakdown into three basic size groups, large, medium and small, was selected by the author because this appears to be the logical separation used in most literature on this question. Dr. Conant's recommended minimum was one-hundred in the graduating class. Twelve to fifteen hundred enrollment is often used as the separation of the medium and large size schools.

Population Under Study

The population of this study consists of 2,746 freshmen students at Michigan State University in the fall term of 1958. Transfer students, foreign students and those freshmen who failed to show at the time of testing were not included in the study. The group consisted of 1,436 males and 1,310 females. The percentage breakdown was 52 per cent to 48 per cent.

Selection of Sample

A random sample on one-hundred males and one-hundred females was selected from each of the three high school size groups. Of this original total of six-hundred, one-hundred and eighty-seven completed their college work at Michigan State University in four years and were retested in the follow-up study.

Statistical Method

The statistical method employed in this study is the analysis of variance. Since we are using three groups of students and we desire to test for any significant difference among these groups, the analysis of variance techniques would be simpler and more convenient than using the t test.

As the name implies, analysis of variance uses variances as a measuring tool. Edwards explains what this means:¹

The rationale of the analysis of variance is that the total sum of squares of a set of measurements composed of several groups can be analysed or broken down into specific parts, each part identifiable with a given source of variation. In the simplest case, the total sum of squares is analyzed into two parts: a sum of squares based upon variation within the several groups, and a sum of squares based upon the variation between the group means. Then, from these two sums of squares, independent estimates of the population variance are computed.

¹Allen L. Edwards, Statistical Methods for the Behavioral Sciences (New York: Holt, Rinehart and Winston, 1961), p. 315.

In analysis of variance, we accept the assumption that the groups are random samples of a common population, and our estimates of the population variance may be expected to vary only within the limits of random sampling. The null hypothesis is tested by dividing the mean square score between groups by the mean square score within groups. This gives an F score which is then compared to the tables of F scores, developed by Snedecor. If the observed F, the variance ratio, equals or exceeds the value found in the tables, then the null hypothesis is rejected. That is, the judgment is made that the samples do not come from a common population.

The five per cent level of significance was used in this experiment to test the null hypothesis. That is, we will accept the null hypothesis as tenable if the score falls within the limits of the confidence interval.

Summary

Two basic groups of instruments were used in this study. The first group was composed of three intellectual tests: the College Qualification Test, the Michigan State University Reading Test, and the Critical Thinking Test. The second battery is made up of three instruments designed to survey student attitudes and values. They are: the Inventory of Beliefs, the Differential Values Inventory and Rokeach's Dogmatism Scale.

The collection of data in this longitudinal type study was carried out over a four year period. In the initial battery, all six tests were administered to the entering freshman class at Michigan State University in the fall of 1958. The follow-up study was composed of a re-test on four of the instruments used in the original battery. A check was made of the cumulative grade point averages of the graduating seniors as part of the follow-up study.

The subjects were separated according to the size of the high school from which they graduated, and also by sex. The school size breakdown was as follows: Large--over 400 in the graduating class; Medium--100 to 399 in the class; and Small--99 or less in the high school class.

The population of the study was the 1958 freshman class at Michigan State University, not counting transfers, foreign students and those not taking the complete battery. A random sample of one-hundred males and one-hundred females was selected from each high school size group.

The statistic used was the analysis of variance. The hypotheses were all listed as null hypotheses. The five per cent level of confidence was employed in rejecting the null hypothesis.

CHAPTER IV

ANALYSIS OF RESULTS--INTELLECTIVE VARIABLES

The findings reported in this chapter are divided into two basic sections: a survey of the freshmen as they enter college and a follow-up study of the same groups after four years of college. The freshmen are separated into sub-groups according to the size of the high school from which they graduated, large, medium or small. The sexes are studied together and also individually.

The three intellectual instruments used to test the freshmen were the following: the College Qualification Test, the Critical Thinking Test, and the Michigan State University Reading Test. In the follow-up study of the college seniors, only the Critical Thinking Test was given.

Survey of College Freshmen

Males and Females Combined

Hypothesis No. 1.--There are no differences among the various high school size groups on the College Qualification Test, administered at the beginning of their freshman year of college.

TABLE 1.--Analysis of Variance for Three Groups of College Freshmen, of One Hundred Subjects Each, Representing Various Size High Schools, Tested with the College Qualification Test

Source of Variance	Sum of Squares	Df	Mean Square	F
Between Groups	1,581.40	2	790.70	1.15
Within Groups	409,977.00	597	686.39	
Total	411,558.40	599		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 2--There are no differences among the various high school size groups on the Critical Thinking Test, administered at the beginning of their freshman year of college.

TABLE 2.--Analysis of Variance for Three Groups of College Freshman, of One Hundred Students Each, Representing Various Size High Schools, Tested with the Critical Thinking Test

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	69.75	2	34.88	.66
Within Groups	31,325.62	597	52.17	
Total	31,395.37	599		

Results: Non-significant at the .05 level of confidence
 Conclusions: Null hypothesis accepted

Hypothesis No. 3.--There are no differences among the various high school size groups on the Michigan State University Reading Test, administered at the beginning of their freshman year of college.

TABLE 3.--Analysis of Variance for Three Groups of College Freshmen of One Hundred Students Each, Representing Various Size High Schools, Tested with the Michigan State University Reading Test

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	156.88	2	78.44	1.99
Within Groups	23,524.12	597	39.40	
Total	23,681.00	599		

Results; Non-significant at the .05 level of confidence
Conclusion; Null hypothesis accepted

Males Only

Hypothesis No. 4.--There are no differences among the males from the various high school size groups on the College Qualification Test, administered at the beginning of their freshman year of college.

TABLE 4.--Analysis of Variance for Three Groups of College Freshmen, of One Hundred Students Each, All Males Representing Various Size High Schools, Tested With the College Qualification Test

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	564.70	2	282.35	.43
Within Groups	194.222.30	297	653.94	
Total	194,787.00	299		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 5.--There are no differences among the males from the various high school size groups on the Critical-Thinking Test, administered at the beginning of their freshman year of college.

TABLE 5.--Analysis of Variance for Three Groups of College Freshmen, of One Hundred Students Each, All Males, Representing Various Size High Schools, Tested With the Critical Thinking Test

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	126.75	2	63.38	1.31
Within Groups	14,320.64	297	48.22	
Total	14.447.39	299		

Results: Non-significant at the 0.5 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 6.--There are no differences among the males from the various size high school groups on the Michigan State University Reading Test, administered at the beginning of their freshman year of college.

TABLE 6.--Analysis of Variance for Three Groups of College Freshmen, of One Hundred Students Each, All Males, Representing Various Size High Schools, Tested with the Michigan State University Reading Test

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	.51	2	.26	.007
Within Groups	11,598.48	297	39.02	
Total	11,598.99	299		

Results: Non-significant at the .05 level of confidence
Conclusion: Null hypothesis accepted

Females Only

Hypothesis No. 7.--There are no differences among the females from the various high school size groups on the College Qualification Test, administered at the beginning of their freshman year of college.

TABLE 7.--Analysis of Variance for Three Groups of College Freshmen, of One Hundred Students Each, All Females, Representing Various Size High Schools, Tested with the College Qualification Test

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	1,144.90	2	572.45	.86
Within Groups	197,973.80	297	666.58	
Total	199,118.70	299		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 8.--There are no differences among the females from the various high school size groups on the Critical Thinking Test, administered at the beginning of their freshman year of college.

TABLE 8.--Analysis of Variance for Three Groups of College Freshmen, of One Hundred Students Each, All Females, Representing Various Size High Schools, Tested with the Critical Thinking Test

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	30.45	2	15.23	.27
Within Groups	16,783.10	297	56.51	
Total	16,813.55	299		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 9.--There are no differences among the females from the various high school size groups on the Michigan State University Reading Test, administered at the beginning of their freshman year of college.

TABLE 9.--Analysis of Variance for Three Groups of College Freshmen, of One Hundred Students Each, All Females, Representing Various Size High Schools, Tested with the Michigan State University Reading Test

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	319.76	2	159.88	4.07
Within Groups	11,671.21	297	39.30	
Total	11,990.97	299		

Results: Significant at the .05 level of confidence
Conclusion: Null hypothesis rejected

Survey of College Seniors

Males and Females Combined

Hypothesis No. 10.--There are no differences among the various high school size groups on the Critical Thinking Test, administered during their senior year of college.

TABLE 10.--Analysis of Variance for Three Groups of College Seniors, Representing Various Size High Schools, Tested with the Critical Thinking Test

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	419.70	2	209.85	.40
Within Groups	99,215.80	187	530.57	
Total	99,635.50	189		

Result: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Males Only

Hypothesis No. 11.--There are no differences among the males from the various high school size groups on the Critical Thinking Test, administered during their senior year of college.

TABLE 11.--Analysis of Variance for Three Groups of College Seniors, Males Only, Representing Various Size High Schools, Tested with the Critical Thinking Test

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	589.36	2	294.68	.52
Within Groups	60,631.94	108	561.41	
Total	61,221.30	110		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Females Only

Hypothesis No. 12.--There are no differences among the females from the various high school size groups on the Critical Thinking Test, administered during their senior year of college.

TABLE 12.--Analysis of Variance for Three Groups of College Seniors, Females Only, Representing Various Size High Schools, Tested with the Critical Thinking Test

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	332.68	2	166.34	.33
Within Groups	37,925.52	76	499.02	
Total	38,258.80	78		

Results: Non-significant at the .05 level of confidence
 Conclusions: Null hypothesis accepted

CHAPTER V

ANNALYSIS OF RESULTS--AFFECTIVE VARIABLES

There are factors other than intellectual variables that need to be taken into consideration in the study of high school preparation as it relates to future success at college. Attitudes and values, in many cases, are the determining factors in the college students achieving academic success. This investigation of the affective variables is divided into two basic sections, similar to those in the preceding chapter. The first section is an analysis of the testing of college freshmen and the second deals with a follow-up study of the group when they were college seniors. The following instruments were used in the study of attitudes and values: Inventory of Beliefs, Form I, Differential Values Inventory, and Rokeach's Dogmatism Scale, Form E.

Affective Variables at the Beginning of College Careers

Males and Females Combined

Hypothesis No. 13.--There are no differences among the various high school size groups on the Inventory of Beliefs, administered at the beginning of their freshman year of college.

TABLE 13.--Analysis of Variance for Three Groups of College Freshmen, of Two Hundred Students Each, Representing Various Size High Schools, Tested with the Inventory of Beliefs

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	26.00	2	13.00	.08
Within Groups	101,669.50	597	170.30	
Total	101,695.50	599		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 14.--There are no differences among the various high school size groups on the Differential Values Inventory, administered at the beginning of their freshman year of college.

TABLE 14.--Analysis of Variance for Three Groups of College Freshmen, Two Hundred Students Each, Representing Various Size High Schools, Tested with the Differential Values Inventory

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	409.49	2	204.74	4.17
Within Groups	29,326.88	597	49.12	
Total	29,736.37	599		

Results: Significant at the .05 level of confidence
 Conclusion: Null hypothesis rejected

Hypothesis No. 15.--There are no differences among the various high school size groups on the Dogmatism Scale, administered at the beginning of their freshman year of college.

TABLE 15.--Analysis of Variance for Three Groups of College Freshmen, Two Hundred Students Each, Representing Various Size High Schools, Tested with the Dogmatism Scale

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	353.00	2	176.50	.29
Within Groups	361,835.00	597	606.09	
Total	362.188.00	599		

Results: Non-significant at the .05 level of confidence
Conclusion: Null hypothesis accepted

Males Only

Hypothesis No. 16.--There are no differences among the males from the various high school size groups on the Inventory of Beliefs, administered at the beginning of their freshman year of college.

TABLE 16.--Analysis of Variance for Three Groups of College Freshmen, One Hundred Students Each, Representing Various Size High Schools, Tested With the Inventory of Beliefs

Source of Variance	Sum of Squares	df	Mean Squares	F
Between Groups	84.65	2	42.33	.23
Within Groups	55,634.25	297	187.32	
Total	55,718.90	299		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 17.--There are no differences among the males from the various high school size groups on the Differential Values Inventory, administered at the beginning of their freshman year of college.

TABLE 17.--Analysis of Variance for Three Groups of College Freshmen, One Hundred Students Each, Representing Various Size High Schools, Tested with the Differential Values Inventory

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	186.85	2	93.43	1.91
Within Groups	14,515.99	297	48.88	
Total	14,702.84	299		

Results: Non-significant at the .05 level of confidence
 Conclusions: Null hypothesis accepted

Hypothesis No. 18.--There are no differences among the males from the various high school size groups on the Dogmatism Scale, administered at the beginning of their freshman year of college.

TABLE 18.--Analysis of Variance for Three Groups of College Freshmen, One Hundred Students Each, Representing Various Size High Schools, Tested With the Dogmatism Scale

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	1,959.70	2	979.85	1.54
Within Groups	187,881.30	297	632.60	
Total	189,841.00	299		

Results: Non-significant at the .05 level of confidence
Conclusion: Null hypothesis accepted

Females Only

Hypothesis No. 19.--There are no differences among the females from the various high school size groups on the Inventory of Beliefs, administered at the beginning of their freshman year of college.

TABLE 19.--Analysis of Variance for Three Groups of College Freshmen, One Hundred Students Each, Representing Various Size High Schools, Tested with the Inventory of Beliefs

Source of Variance	Sum of Squares	df	Mean Squares	F
Between Groups	11.19	2	5.59	.04
Within Groups	45,706.81	297	153.89	
Total	45,718.00	299		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 20.--There are no differences among the females from the various high school size groups on the Differential Values Inventory, administered at the beginning of their freshman year of college.

TABLE 20.--Analysis of Variance for Three Groups of College Freshmen, One Hundred Students Each, Representing Various Size High Schools, Tested With the Differential Values Inventory

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	352.65	2	175.33	3.68
Within Groups	14,247.39	297	47.97	
Total	14,600.04	299		

Results: Significant at the .05 level of confidence
 Conclusion: Null hypothesis rejected

Hypothesis No. 21.--There are no differences among the females from the various high school size groups on the Dogmatism Scale, administered at the beginning of their freshman year of college.

TABLE 21.--Analysis of Variance for Three Groups of College Freshmen, One Hundred Students Each, Representing Various Size High Schools, Tested with the Dogmatism Scale

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	317.30	2	158.65	.28
Within Groups	169,156.40	297	569.55	
Total	169,473.70	299		

Results: Non-significant at the .05 level of confidence
Conclusion: Null hypothesis accepted

Affective Variables After Four
Years of College

Males and Females Combined

Hypothesis No. 22.--There are no differences among the various high school size groups on the Inventory of Beliefs, administered during their senior year of college.

TABLE 22.--Analysis of Variance for Three Groups of College Seniors, Representing Various Size High Schools, Tested with the Inventory of Beliefs

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	40.63	2	20.31	.51
Within Groups	7,392.64	187	39.53	
Total	7,433.27	189		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 23.--There are no differences among the various high school size groups on the Differential Values Inventory, administered during their senior year of college.

TABLE 23.--Analysis of Variance for Three Groups of College Seniors, Representing Various Size High Schools, Tested with the Differential Values Inventory

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	133.72	2	66.86	1.32
Within Groups	9,491.55	187	50.76	
Total	9,625.27	189		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 24.--There are no differences among the various high school size groups on the Dogmatism Scale, administered during their senior year of college.

TABLE 24.--Analysis of Variance for Three Groups of College Seniors, Representing Various Size High Schools, Tested with the Dogmatism Scale

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	88.63	2	44.32	.23
Within Groups	36,693.27	187	196.22	
Total	36,781.90	189		

Results: Non-significant at the .05 level of confidence
Conclusion: Null hypothesis accepted

Males Only

Hypothesis No. 25.--There are no differences among the males from the various high school size groups on the Inventory of Beliefs, administered during their senior year of college.

TABLE 25.--Analysis of Variance for Three Groups of College Seniors, All Males, Representing Various Size High Schools, Tested with the Inventory of Beliefs

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	79.66	2	39.83	1.22
Within Groups	3,531.82	108	32.70	
Total	3,611.48	110		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 26.--There are no differences among the males from the various high school size groups on the Differential Values Inventory, administered during their senior year of college.

TABLE 26.--Analysis of Variance for Three Groups of College Seniors, All Males, Representing Various Size High Schools, Tested with the Differential Values Inventory

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	174.01	2	87.00	1.79
Within Groups	5,243.85	108	48.55	
Total	5,417.86	110		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 27.--There are no differences among the males from the various high school size groups on the Dogmatism Scale, administered during their senior year of college.

TABLE 27.--Analysis of Variance for Three Groups of College Seniors, All Males, Representing Various Size High Schools, Tested with the Dogmatism Scale

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	449.14	2	224.57	1.04
Within Groups	23,269.57	108	215.46	
Total	23,718.71	110		

Results: Non-significant at the .05 level of confidence
Conclusion: Null hypothesis accepted

Females Only

Hypothesis No. 28.--There are no differences among the females from the various high school size groups on the Inventory of Beliefs, administered during their senior year of college.

TABLE 28.--Analysis of Variance for Three Groups of College Seniors, All Females, Representing Various Size High Schools, Tested with the Inventory of Beliefs

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	40.28	2	20.14	.41
Within Groups	3,768.10	76	49.58	
Total	3,808.38	78		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 29.--There are no differences among the females from the various high school size groups on the Differential Values Inventory, administered during their senior year of college.

TABLE 29.--Analysis of Variance for Three Groups of College Seniors, All Females, Representing Various Size High Schools, Tested with the Differential Values Inventory

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	15.20	2	7.60	.16
Within Groups	3,512.47	76	46.22	
Total	3,527.67	78		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

Hypothesis No. 30.--There are no differences among the females from the various high school size groups on the Dogmatism Scale, administered during their senior year of college.

TABLE 30.--Analysis of Variance for Three Groups of College Seniors, All Females, Representing Various Size High Schools, Tested with the Dogmatism Scale

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	152.27	2	76.14	.48
Within Groups	12,058.77	76	158.67	
Total	12,211.04	78		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

CHAPTER VI

ANALYSIS OF RESULTS--COLLEGE GRADES

In addition to the study of affective and intellectual variables, this investigation surveyed the final college grade point averages of students from the various size high schools.

Hypothesis No. 31.--There are no differences among the various high school size groups on their final grade point averages at colleges.

TABLE 31.--Analysis of Variance for Three Groups of College Seniors, Representing Various Size High Schools, Compared on the Basis of Their Final Grade Point Averages

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	8,850.27	2	4,425.13	2.80
Within Groups	518,571.06	244	2,125.29	
Total	527,421.32	246		

Results: Non-significant at the .05 level of confidence
Conclusion: Nul hypothesis accepted

Males Only

Hypothesis No. 32.--There are no differences among the males from the various high school size groups on their final grade point averages in college.

TABLE 32.--Analysis of Variance for Three Groups of College Seniors, Males Only, Representing Various Size High Schools, Compared on the Basis of Their Final Grade Point Averages

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	14,688.60	2	7,344.30	3.33
Within Groups	237,837.00	108	2,202.00	
Total	252,525.60	110		

Results: Significant at the .05 level of confidence
 Conclusion: Null hypothesis rejected

Females Only

Hypothesis No. 33.--There are no differences among the females from the various high school size groups on their final grade point averages in college.

TABLE 33.--Analysis of Variance for Three Groups of College Seniors, Females Only, Representing Various Size High Schools, Compared on the Basis of Their Final Grade Point Averages

Source of Variance	Sum of Squares	df	Mean Square	F
Between Groups	317.50	2	158.75	.08
Within Groups	273,372.30	133	2,055.43	
Total	273,689.80	135		

Results: Non-significant at the .05 level of confidence
 Conclusion: Null hypothesis accepted

A summary of the grade point averages of the various high school size groups is included in the following table.

TABLE 34.--The Final College Grade Point Averages of Seniors From Various Size High Schools

School Size	Males and Females	Males Only	Females Only
Large	2.61	2.53	2.68
Medium	2.75	2.80	2.71
Small	2.64	2.60	2.68

Summary of ResultsIntellective Variables: College Freshmen

	<u>All Freshmen</u>	<u>Males Only</u>	<u>Females Only</u>
College Qualification Test	N.S.	N.S.	N.S.
Critical Thinking Test	N.S.	N.S.	N.S.
MSU Reading Test	N.S.	N.S.	Sign.

Intellective Variables: College Seniors

	<u>All Seniors</u>	<u>Males Only</u>	<u>Females Only</u>
Critical Thinking Test	N.S.	N.S.	N.S.

Affective Variables: College Freshmen

	<u>All Freshmen</u>	<u>Males Only</u>	<u>Females Only</u>
Inventory of Beliefs	N.S.	N.S.	N.S.
Differential Values Inventory	Sign.	N.S.	Sign.
Dogmatism Scale	N.S.	N.S.	N.S.

Affective Variables: College Seniors

	<u>All Seniors</u>	<u>Males Only</u>	<u>Females Only</u>
Inventory of Beliefs	N.S.	N.S.	N.S.
Differential Values Inventory	N.S.	N.S.	N.S.
Dogmatism Scale	N.S.	N.S.	N.S.

Notes: All comparison are among the three high school size groups; large, medium and small.

N.S.--non-significant at the .05 level

Sign.--significant at the .05 level of confidence

CHAPTER VII

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary of the Study

In recent years, many writers and educators have argued that the small high school was not providing an adequate education for its students, especially those who went on to college. At the same time, criticism was being leveled at the large, metropolitan high schools because they were becoming too big and impersonal. The question therefore arises, what is the optimum size for a high school in order to provide the most economical and effective educational program.

In our approach to this problem, we analyzed first the various complaints against our nation's high schools, both large and small. Generally, criticism of the small high school was focused on their limited course offerings and poorly trained teachers. They also come under reprehension for the high cost of operation and administration.

Censure of the large school stems mainly from an alleged impersonal approach to education. In many cases, there seems to be a lack of personal identification by the individual student with the school and his fellow classmates.

This atmosphere causes the student to feel small and unimportant. Likewise, the large groups make it difficult to transmit the teachings of proper attitudes and values

The primary purpose of this investigation is to study the graduates of the various size high schools who went on to college, in an effort to determine if real differences do exist. Three crucial questions are proposed for empirical investigation:

1. Is there any relationship between high school size and academic preparation for college?
2. Is there any relationship between high school size and academic achievement at college?
3. Is there any relationship between high school size and student attitudes and values?

Related Research

After reviewing the literature in the field, we found the results are inconclusive as to whether or not high school size is a significant factor in determining future academic success at college. Over the years, the studies performed on this subject have produced, in the main, either results showing the small high schools academically inferior or results indicating no significant differences in the comparison of the high schools of various size.

In the state of Michigan, very little work has been done in the area of a scientific investigation of high

school size and college achievement. This is the first attempt made to study this question with the students of Michigan State University.

A number of articles can be found in professional journals which emphasize the importance of psychological considerations in determining the effectiveness of various size high schools. In spite of this, there has been no previous research, to our knowledge, relating high school size to the development of attitudes and values.

Research dealing with attitudes and value change during the college years has produced a variety of conclusions. Those investigators who found significant changes, as indicated in Chapter II, generally concluded that the tendency was toward more conformity in thought and behavior. A few researchers found an increase in open-mindedness as the student progressed through college. Other studies found no change in attitudes, of any degree of significance, taking place during the college years. This particular study concentrates on the question whether there has been significant attitude changes during the college years of students who graduated from various size high schools.

Methods Employed

The methodology of this study contains a description of the instruments used, the selection of the sample of the

population under study, and an explanation of the means of collecting and analyzing the data.

The instruments used in this study, as described in Chapter III, were the following: the College Qualification Test, Critical Thinking Test, Form G, the Michigan State University Reading Test, Inventory of Beliefs, Form I, Rokeach's Dogmatism Scale, Form E, and the Differential Values Inventory.

The above six tests were given to the entering freshman at Michigan State University in the fall of 1958. After four years of college, a follow-up battery composed of four of these same instruments was given to the graduating seniors.

The group's academic achievement at college was measured by surveying the final grade point averages of the graduating seniors.

The student groups were compared on the basis of the size of their high school graduating class. The high schools were divided into three ranges: large, medium and small.

The statistical techniques of the analysis of variance were used in making the comparisons of the high school size groups.

Findings

The analysis of the first results concerned the intellectual tests. We found no differences among the students from the various size high schools in the area of academic preparation. When the freshman males were studied separately, there were also no significant differences on their scores on these tests. The only significant difference among the freshman girls occurred on the Michigan State University Reading Test. On this test, the highest scores were attained by the female students from the medium size high schools.

After four years of college, the graduates from the various size high schools were again compared on the Critical Thinking Test. The results showed no significant differences among the three groups either when studied separately by sex or when grouped together.

In the survey of attitudes and values among the students from large, medium and small high schools, no significant differences were found on the Inventory of Beliefs or on the Dogmatism Scale, both in the testing of freshmen and also in the study of college seniors.

Significant differences were noted among the college freshmen, when compared in relationship to the size of the high school from which they graduated, on the Differential Values Inventory. This difference also showed up when the

freshman girls were compared but not in the comparison of the males. After four years of college these differences disappeared.

In comparing the high school size groups on the basis of the final college grade point averages, there were no significant differences among the groups when the males and females were studied together. Significant differences did occur when the males were compared separately, but not in the comparison of the females.

Conclusions

Our general conclusion from these findings is that there appears to be very little difference among the graduates of the various size high schools who entered Michigan State University in 1958. Academically, the intellectual tests, which were given to the entering freshmen, indicated no differences in the preparation of these students in the areas of reading, critical thinking and general academic knowledge.

After four years of college, a survey of the student groups points out the fact that high school size also was not a factor in the final grade point averages of the college seniors.

Our investigation of student attitudes and values was based on the belief that there are other worthwhile considerations in the determination of the optimum size

high school. Our conclusions from this investigation were that the size of the graduating class, which was our indication of the size of the high school, does not have a profound effect on these college students in the area of attitudes and values.

The one test of values on which a significant difference was detected, the Differential Values Inventory, indicated that freshmen from the small high schools were more traditional in their views. That is, they tended to regard more highly the values of puritan morality, the meaning of work and responsibility, and the ideas of individualism. Since these differences did not occur when the males were tested separately, most of the differences can be attributed to the scores made by the female students. After four years of college life, a re-test with the Differential Values Inventory showed no differences among the high school size groups when the seniors were studied.

The initial differences in this area among the freshmen from the large and small schools is in agreement with a similar study using the DVI, which was performed by Ikenberry.¹ He compared students on the basis of home background and found: "Students who lived a major portion of

¹Ikenberry and Lehmann. Critical Thinking. . ." A Preliminary Report., p. 34.

their life on a farm or in a small community have a significantly higher traditional value score than those who come from an urban center."

The implications of this study for school administrators can be found first in the need for more knowledge concerning the optimum size high school. Opinions should give way to a scientific analysis of the advantages and disadvantages of various size units. In school consolidation studies, the general public looks to the school administrator for professional advice in future schoolhouse planning.

The school administrator, who is charged with the responsibility for the development of curricular and co-curricular activities, must select those programs with the objective of developing proper attitudes and values in the students' minds. He must be aware of the factors, both internal and external to the school system, which effect the development of these values and attitudes. This study revealed that size is not a major factor in this area.

In our generalizations from the results of this study, we propose it as additional evidence for the arguments that high school size is not a leading factor in determining future academic success at college. This study does not rule out other advantages of school consolidations, but it is contending that the academic arguments as concerning those students who went on to college, have not been verified by

research statistics. This group of college bound students is only a portion of the total school population. In determining the optimum size high school, consideration must also be given to those students who do not aspire to a college education.

In the past, most of the research concerning high school size limited itself to the investigation of grade records and economic factors. While this study is far from conclusive, it does show that we use additional insight into the development of attitudes and values at this stage of the student's educational career. This study might provide a beginning to the building of empirical data which would lead to some conclusions in this field.

The results of this study might also be of interest to college counselors and admission officers. These educators have sometimes generalized that the small high school graduates operated at a disadvantage in competing in college classes with students from the large high schools. The results of the present study do not verify this assumption.

Recommendations

As a suggestion for addition research, it is proposed that a similar study be carried on at a private, metropolitan college. The character of the student population at this

type of institution might be radically different from that of the large, state university, such as Michigan State University.

The results of this type of investigation might also vary from state to state, depending upon the amount of state aid given to the rural school systems. In poor states, where the amount of money provided for education is relatively low, the small, rural schools are the first to suffer. This is particularly true in the areas where the state law allows an eight months school term.

Our final recommendation is that each school administrator should examine his own local situation, in light of the present information, to judge whether or not the graduates of his high school are achieving reasonably well in their college endeavors.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Altman, Ester Royal. "The Effect of Rank in Class and Size of High School on the Academic Achievement of Central Michigan College Senior Class of 1957," Journal of Educational Research 8:307, April, 1959.
- . "The High School in a Changing Work," American Association of School Administrators' Yearbook 1958, Washington, D. C.
- Bennett, George K., Bennett, Marjorie G., Winburn L. Wallace, and Alexander G. Wesman. College Qualification Tests, Manual, 1957. New York: The Psychological Corporation, 1957.
- Brown, Ruth A. "A Study of High School and First Semester College Records of Freshmen Entering Twenty Colleges in Michigan in 1928," Journal of the Michigan Schoolmasters' Club, 1930, p. 18.
- Bugelski, Richard and Olive P. Lester. "Changes in Attitudes in a Group of College Students During Their College and After Graduation," Journal of Social Psychology 12:319-332, 1940.
- Conant, James B. The American High School Today. New York: McGraw-Hill Book Co., 1959, p. 14.
- . "Educator Says High Schools Too Small," Indianapolis Star, May 10, 1950, p. 1.
- . "The Size of High School Considered to be the Most Efficient Scholastically and Economically," Corpus Christi Public Schools, May 4, 1959.
- Dawson, Howard A., et al. Your School District (National Commission of School District Reorganization, Department of Rural Education.), Washington, D. C.: National Educational Association, 1948.
- Dressel, Paul. Director of Cooperative Study of Evaluation in General Education. "Instructor's Manual for the Inventory of Beliefs," The American Council on Education, Committee on Measurement and Evaluation, 1953.

Dressel, Paul. Director, Cooperative Study of Evaluation in General Education, "Instructor's Manual for the Test of Critical Thinking, Form G," The American Council on Education, Committee on Measurement and Evaluation, 1953.

_____. "Interest--Stable or Unstable," Journal of Educational Research, 48:95-102, 1954.

Dressel, Paul and Lewis B. Mayhew. General Education: Explorations in Evaluation. Washington, D. C.: American Council on Education, 1954.

Dwyer, P. S. "Some Suggestions Concerning the Relationship Existing Between Size of High School Attended and Success in College," Journal of Educational Research 32:271, December, 1938.

Eddy, Edward D. The College Influence on Student Character, Washington, D. C.: American Council on Education, 1959, p. 137.

Edwards, Allen L. Statistical Methods for the Behavioral Sciences: New York, Holt, Rinehard and Winston, 1961

Elsbree, Willard S. and E. Edmund Rutter, Jr. Staff Personnel in the Public Schools, Englewood Cliffs, J. J.: Prentice-Hall, Inc., 1954, p. 23.

Faunce, Roland C. and Theodore D. Rice. "The Michigan Secondary School," A Report of the Michigan Study of Secondary School Curriculum, 1937-1945. Lansing, Michigan, 1945.

Gaumnitz, Walter H. and Ellsworth Tompkins. "How Large Are Our Public High Schools," Federal Security Agency, Office of Education, Circular No. 304.

Harmon, Lindsey R. "On Decision Making in High School" National Association of Secondary School Principals Bulletin, 46:277, November, 1962.

Holland, John. "The Prediction of College Success from the California Psychological Inventory and Scholastic Aptitude Test," Journal of Educational Psychology, August, 1959, p. 135.

Holt, Donald P. "Size of High School and College Grades," Personnel and Guidance Journal, 37:569, April, 1959.

Indiana School Study Commission. "An Evaluation of the Indiana Public Schools," Commission Report, 1959, Indianapolis, Indiana, p. 332.

Ikenberry, Stanley O. "A Multivariate Analysis of the Relationship of Academic Aptitude, Social Background, Attitudes and Values to College Persistence." unpublished Doctoral Dissertation, Michigan State University, East Lansing, Michigan, 1960, p. 50.

Ikenberry, Stanley O. and Irvin J. Lehmann. Critical Thinking, Attitudes and Values in High Education, East Lansing, Michigan, Michigan State University, 1959.

Ikenberry, Stanley O. and Irvin J. Lehmann. Critical Thinking, Attitudes and Values in Higher Education. A Preliminary Report, Michigan State University East Lansing, Michigan, 1959, p. 57.

Jacob, Philip E. Changing Values in College, New Haven, Conn., Hazen Foundation, 1956.

Kowitz, Gerald T. and William C. Sayres. "Size, Cost and Educational Opportunity in Secondary Schools," Division of Research, New York State Education Department, Albany, New York, p. 71

Kuhlen, Raymond G. "Changes in the Attitudes of Students and Relations of Test Responses to Judgments of Associates," School and Society, 53:514-9, April, 1941.

Livingston, A. Hugh. "Is There an Optimum Size High School?" Progressive Education, September, 1956.

McTarnaghan, Roy E. "An Analysis of Certain Personality Factors and Academic Success in the State University College, Geneseo, New York." Unpublished Doctoral Dissertation, Michigan State University, East Lansing, Michigan, 1962.

_____. Standards for School Planning. Metropolitan Planning Commission of Pulaski County, Arkansas, September, 1957.

Michigan Educational Directory Service. Michigan Education Directory and Buyer's Guide, 1960-61, Lansing, Michigan.

- Morgan, H. H. "A Study of Achieving and Nonachieving Students of High Ability," Journal of Consulting Psychology, 16:292-8, 1952.
- Morphet, Edgar L., Roe L. Johns and Theodore L. Reller, Educational Administration, Concepts, Practices and Issues, Englewood Cliffs, N. J.: Prentice-Hall, 1959.
- National Education Association Research Division. Efficient School Size, National Education Association Bulletin, Washington, D. C., January, 1959.
- Oliver, A. I. "How Big Should the Small School Be?" School and Society, 69:128, 1959.
- Pittenger, Benjamin Floyd. "The Efficiency of College Students as Conditioned by Age at Entrance and Size of High School," The Sixteenth Yearbook of the National Society for the Study of Education, Part II, Bloomington, Illinois: Public School Publishing Company, 1919.
- Plant, Walter J. "Changes in Ethnocentrism Associated with a Four-Year College Education," Journal of Educational Psychology, 49:109, 1958.
- Prince, Richard, "A Study of the Relationship Between Individual Values and Administrative Effectiveness in the School Situation." Unpublished Doctoral Dissertation, University of Chicago, 1957.
- Rokeach, Milton J. "Political and Religious Dogmatism: An Alternative to Authoritarian Personality," Psychological Monographs, 70:425, 1956.
- _____. "The Nature and Meaning of Dogmatism," Psychological Review 61:203, 1954.
- _____. The Open and Closed Mind, Basic Books, Inc., New York, 1960.
- Rust, Ralph M. and F. J. Ryan. "The Relationship of Some Rorschach Variables to Academic Behavior," Journal of Personality, 21:411-56, June, 1953.
- Sanford, Nevitt. "Personality Development During the College Years," Personnel and Guidance Journal, 35:74-80, October, 1956.

- Saupe, Mildred W. "Size of High School as a Factor in the College Success of Average and Superior Graduates," Journal of the American Association of Collegiate Registrars, October, 1941, p. 45.
- Shafer, Dwight. "Analysis of Certain Factors in the High School Preparation of High School Graduates Entering Selected Iowa Colleges." Unpublished Doctoral Dissertation, University of Iowa, Iowa City, 1956.
- Shannon, J. R. "Criteria for Determining Local Units of School Administration," American School Board Journal, 64:28, October, 1949.
- Shaw, A. B. "A New Look at Secondary Education: A Random Fall Idea," School Executive, 75:47-86, March, 1956.
- Smith, Clifford B. "A study of the Optimum Size Secondary School." Unpublished Doctoral Dissertation, Ohio State University, Columbus, Ohio, 1960.
- Stalnaker, J. M. and H. H. Remmers. "What Kind of High Schools Contribute to College Failures?" Bulletin of Purdue University, 30:23, March, 1930
- State Department of Education of Connecticut. Report on Schools, 1956.
- Thornburg, L. H. "College Scholarship and Size of High School," School and Society, 20:189, August, 1924.
- Thorndike, E. L. "A Neglected Aspect of the American High School," Educational Review, 33:245-255.
- Tulare County Planning Commission. Tulare City School District: A Planning Analysis, 1954.
- Tulsa Metropolitan Area Planning Commission. Public School Needs, April, 1960.
- U. S. Office of Education. Circular No. 634, Fall, 1960.
- Webster, Harold. "Changes in Attitudes During College," Journal of Educational Psychology, 49:109, 1958.
- "What Size School is Best?" Opinion Poll, Nations Schools, October, 1954, 54:59.

White, Harland W. "A Study of the High School Record as a Criterion for Admission to Purdue University," Office of Admissions, Purdue University, 1951, p. 25.

Young, John F. "A Comparison of the Academic Preparation and Achievement of College Students from Various Size High Schools in Indiana." Unpublished Doctoral Dissertation, Purdue University, Lafayette, Indiana, 1958.

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